

Amendments to the Claims

Please amend claims 12, 55, and 70. The Claim Listing below will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Previously Presented) A process of propagating viewing assets to a system of video servers, the process comprising:

generating a propagation priority for a selected viewing asset that comprises a set of asset elements, each asset element of the set comprising a segment of multimedia data, the propagation priority representing a predicted economic value of propagating the selected viewing asset to a target video server, the propagation priority comprising a first priority associated with the viewing asset and a second priority associated with the target video server;

generating a retention value for each replica of a viewing asset presently stored on the target video server, each retention value representing a predicted economic value of retaining the asset replica on the target video server, each asset replica comprising a set of asset element replicas stored on the target video server;

generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on the target video server and capable of being removed from the target video server as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;

selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;

comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists; and

copying the one or more asset elements of the selected viewing asset to the target video server in response to determining that the propagation priority of the selected viewing asset exceeds the sum of retention values of the one or more selected element deletion lists.

2. (Previously Presented) The process of claim 1, wherein copying the one or more asset elements comprises writing the one or more asset elements of the selected viewing asset onto a storage region of the target video server on which is already stored a replica of one or more viewing assets.
3. (Canceled)
4. (Previously Presented) The process of claim 1, wherein copying the one or more asset elements of a selected viewing asset includes the copying of a missing portion from one or more video servers.
5. (Previously Presented) The process of claim 1, further comprising:
assigning propagation priorities to a plurality of viewing assets;
ranking the viewing assets according to the assigned priorities; and
selecting an asset in response to the asset having a rank higher than a preselected minimum rank.
6. (Canceled)
7. (Canceled)
8. (Canceled)
9. (Previously Presented) The process of claim 1, further comprising: updating retention values of replicas of viewing assets remaining on the target server in response to the copying of the one or more asset elements of the selected viewing asset.
10. (Previously Presented) The process of claim 1, further comprising selecting the viewing assets to include video files for at least one of the movies, news emissions, and shopping emissions.

11. (Original) The process of claim 1, wherein the replica of one or more viewing assets includes a replica of an asset element shared by replicas of two assets on the target server.
12. (Currently Amended) The process of claim 1, ~~further comprising:~~
wherein the second priority is calculated based on replicas available to the target video server, load on the target video server, availability of alternative delivery paths to stream the selected viewing asset to users other than the target video server, processing speed available to the target video server, or any combination thereof[[:]], and the process further comprising:
ranking the viewing assets based on the assigned propagation priorities; and
propagating, to zero or more of the video servers, those viewing assets according to rank.
13. (Previously Presented) The process of claim 12, wherein generating a propagation priority includes:
assigning a viewing asset to a usage class, the usage class providing a portion of an initial value for propagation priorities associated with assets assigned to the class.
14. (Previously Presented) The process of claim 12, further comprising:
accumulating usage data on individual assets stored on the video servers; and
updating the propagation priorities based on the usage data.
15. (Previously Presented) The process of claim 12, wherein the viewing assets include encoded digital video assets, encoded digital audio assets, or combinations of both encoded digital video assets and encoded digital audio assets.
16. (Previously Presented) The process of claim 14, wherein the usage data included data indicative of viewer demand and data indicative of change in viewer demand.

17. (Previously Presented) The process of claim 14, further comprising: updating the propagation priority of a particular asset in a usage class based on a difference between a usage level of the usage class and a usage level of the particular asset determined from the accumulated usage data.
18. (Canceled)
19. (Previously Presented) The process of claim 12, further comprising: streaming a replica of the copied one of the assets from the particular video server to a television of a viewer in response to receiving a request to deliver the asset.

20. (Previously Presented) A process of propagating viewing assets to a target video storage, the process comprising:

assigning propagation priorities to viewing assets, each viewing asset comprises a set of asset elements, each asset element of the set comprising a segment of multimedia data, each of the propagation priorities being predictive of an economic value associated with propagating a viewing asset to a target video storage, each of the propagation priorities comprising a first priority associated with the viewing asset and a second priority associated with the target video storage;

constructing a table of element deletion lists for the target video storage, each of the element deletion lists identifying a set of replicas of asset elements that are capable of being removed from the target video storage as a group, each of the element deletion lists being associated with a retention value;

selecting at least one of the element deletion lists from the table, the selected element deletion list having a data size at least as large as a data size of a portion of a replica of another viewing asset not stored on the target video storage;

comparing a propagation priority of a viewing asset against the retention value of the selected element deletion list; and

copying the portion of the replica of the viewing asset onto the target video storage in response to the propagation priority of the viewing asset exceeding a retention value of the selected element deletion list.

21. (Previously Presented) The process of claim 20, wherein copying the portion of the replica comprises writing the portion onto a region of the target video storage previously storing the group.
22. (Previously Presented) The process of claim 20, wherein selecting at least one element deletion list includes constructing a table that lists sets of element deletion lists with lower retention value than the propagation priority of the asset.

23. (Previously Presented) The process of claim 22, wherein selecting at least one element deletion list includes picking one of the lists having a data size at least as large as the portion of the replica on the asset.
24. (Previously Presented) The process of claim 20, further comprising: updating the table of element deletion lists-after copying the portion of the replica of the asset.
25. (Original) The process of claim 20, wherein each element deletion list includes a set of replicas of asset elements that are shared by the same assets.
26. (Previously Presented) A process of distributing viewing assets to viewers, the process comprising:
 - assigning propagation priorities to viewing assets, each viewing asset comprises a set of asset elements, each asset element of the set comprising a segment of multimedia data, the propagation priorities being predictive of an economic value associated with distributing the viewing assets to a plurality of video servers accessible to viewers, each of the propagation priorities comprising a first priority associated with a viewing asset and a second priority associated with one of the plurality of video servers;
 - selecting a target video server;
 - assigning a retention value to a set of replicas of viewing assets stored on the target video server, the retention value representing a predicted economic value of retaining the set of replicas on the target video server, each asset replica comprising a set of asset element replicas stored on the target video server;
 - generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of replicas of viewing assets presently stored on the target video server and capable of being removed from the target video server as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of replicas of viewing asset;
 - selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of a selected viewing asset;

comparing a propagation priority associated with the selected viewing asset against the sum of retention values associated with the one or more element deletion lists; and

copying the one or more asset elements of the selected viewing asset onto the target video server in response to determining that the propagation priority of the selected viewing asset exceeds the sum of retention values associated with the one or more element deletion lists.

the selected element deletion list exceeds the retention value associated with the set of replicas of viewing assets stored on the target video server, the set of asset elements identified by the selected element deletion list occupying enough space to store the selected viewing asset.

27. (Previously Presented) The process of claim 26, wherein copying the one or more asset elements of the selected viewing asset includes searching for one or more sets of replicas of asset elements to delete from the set of element deletion lists.
28. (Original) The process of claim 26, further comprising: updating the retention values in response to anticipated changes in viewer request levels for assets.
29. (Previously Presented) The process of claim 28, further comprising: accumulating data on usage of individual ones of the assets, and updating the retention values based on least in part on the accumulated data.

30. (Previously Presented) An interactive television system, comprising:

a communication channel selected from the group comprising a network or a bus;
a plurality of video servers to store digital replicas of viewing assets for viewers,
each viewing asset comprises a set of asset elements, each asset element of the set
comprising a segment of multimedia data, the video servers being connected by the
communication channel; and

a control unit connected to the video servers and configured to:

generate a propagation priority for a selected viewing asset, the
propagation priority representing a predicted economic value of propagating the
selected viewing digital asset to the target server, the propagation priority
comprising a first priority associated with the viewing asset and a second priority
associated with the target server,

generate a retention value for each replica of a viewing asset presently
stored on the target server, each retention value representing a predicted economic
value of retaining the asset replica on the target server, each asset replica
comprising a set of asset element replicas stored on the target server,

generate a set of element deletion lists, each element deletion list
identifying a set of asset element replicas that comprise a set of asset replicas
presently stored on the target server and capable of being removed from the target
video as a group, each element deletion list being associated with a sum of
retention values associated with the corresponding set of asset replicas,

select one or more element deletion lists having a data size at least as large
as a data size of one or more asset elements of the selected viewing asset,

compare the propagation priority of the selected viewing asset against the
sum of retention values associated with the one or more selected element deletion
lists, and

copy the one or more asset elements of the selected viewing asset to the
target server in response to determining that the propagation priority of the
selected viewing asset exceeds the sum of retention values of the one or more
selected element deletion lists.

31. (Original) The system of claim 30, wherein the control unit is further configured to record usage data for the assets stored on each of the local video storages.
32. (Previously Presented) The system of claim 30, further comprising: a plurality of distribution networks to provide channels for delivering viewing assets to viewer televisions, each distribution network connected to a subset of the video servers.
33. (Original) The system of claim 30, wherein the control unit is configured to accumulate usage data on viewing assets from the video servers.
34. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 1.
35. (Canceled)
36. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 4.
37. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 5.
38. (Canceled)
39. (Canceled)
40. (Previously Presented) A computer readable medium encoded with executable instructions being executed by data processing apparatus to execute the process of

claim 9.

41. (Previously Presented) A computer readable medium encoded with executable instructions being executed by data processing apparatus to execute the process of claim 12.
42. (Previously Presented) A computer readable medium encoded with executable instructions being executed by data processing apparatus to execute the process of claim 13.
43. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 14.
44. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 16.
45. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 17.
46. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 19.
47. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 20.

48. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 22.
49. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 23.
50. (Previously Presented) A computer readable medium encoded with computer executable instructions being executed by data processing apparatus to execute the process of claim 25.
51. (Canceled)
52. (Canceled)
53. (Canceled)
54. (Previously Presented) The process of claim 12, wherein the first priority is based in part on a counter value, the counter value measuring usage of the selected one of the assets.
55. (Currently Amended) The process of claim 12, wherein the second priority is based in part on a bandwidth for streaming the selected ~~one of the assets~~ viewing asset from the ~~one of the~~ target video server servers to a set of viewers.
56. (Previously Presented) A process for propagating viewing assets, the process comprising:
generating a propagation priority for a selected viewing asset that comprises a set of asset elements, each asset element of the set comprising a segment of multimedia data, the propagation priority representing a predicted economic value of propagating the selected viewing asset to storage of a target device, the propagation priority comprising a first value associated with the viewing asset and a second priority associated with the

target device;

generating a retention value for each replica of a viewing asset presently stored on the target device, each retention value representing a predicted economic value of retaining the asset replica on the target device, each asset replica comprising a set of asset element replicas stored on the target device;

generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on the target device and capable of being removed from the target device as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;

selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;

comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists; and

copying the one or more asset elements of the selected viewing asset to the storage of the target device in response to determining that the propagation priority of the selected viewing asset exceeds the sum of retention values of the one or more selected element deletion lists.

57. (Previously Presented) The process of claim 56, wherein copying the one or more asset elements further comprises: writing the one or more asset elements of the selected viewing asset onto a portion of the storage medium of the target device on which is previously stored a portion of the replica of one or more viewing assets.
58. (Canceled)
59. (Previously Presented) The process of claim 56, wherein copying the one or more asset elements of a selected viewing asset further comprises: copying the one or more asset elements from one or more storage devices.

60. (Previously Presented) The process of claim 56, wherein copying the one or more asset elements of a selected viewing asset further comprises: copying the one or more asset elements from one or more video servers.
61. (Previously Presented) The process of claim 56, further comprising:
assigning propagation priorities to a plurality of viewing assets;
ranking the viewing assets according to the assigned propagation priorities; and
selecting an asset in response to the asset having a rank exceeding a preselected rank.
62. (Canceled)
63. (Original) The process of claim 56, further comprising selecting the target device to be a target video asset device.
64. (Canceled)
65. (Canceled)
66. (Previously Presented) The process of claim 56, wherein each asset replica stored on the target device comprises a set of asset element replicas belonging to at least one element deletion list.
67. (Original) The process of claim 56, further comprising: updating retention values of replicas of viewing assets remaining on the target device in response to the copying.
68. (Original) The process of claim 56, further comprising selecting the viewing assets to include digital information for at least one of movies, news emissions, and shopping emissions.

69. (Previously Presented) The process of claim 56, further comprising selecting viewing assets to include information represented as encoded data files.
70. (Currently Amended) The process of claim 56, ~~further comprising:~~
wherein the second priority is calculated based on replicas available to the target video server, load on the target device, availability of alternative delivery paths to stream the selected asset to users other than the target device, processing speed available to the target device, or any combination thereof[[]], and the process further comprising:
ranking the assets based on the assigned priorities; and
propagating zero or more of the assets to one or more of the target devices according to rank.
71. (Previously Presented) The process of claim 70, wherein generating propagation priorities comprises:
assigning a viewing asset to a usage class, the usage class providing a portion of an initial value for the first priority of assets assigned to that class.
72. (Previously Presented) The process of claim 70, further comprising:
accumulating usage data on individual assets stored on the target devices; and
updating the propagation priorities based on the usage data.
73. (Original) The process of claim 70, wherein the viewing assets include at least one of encoded digital viewing assets and encoded digital audio assets.
74. (Previously Presented) The process of claim 1, wherein the retention value comprises:
a first value associated with the viewing asset and indicative of an economic value of retaining a set of replicas of the viewing asset on the video servers; and
a second value associated with the target video server and indicative of an economic value of retaining the set of replicas on the target video server.

75. (Previously Presented) The process of claim 1, wherein the first priority is calculated based on one or more first components associated with a user demand for the selected asset.
76. (Previously Presented) The process of claim 75, wherein the one or more first components comprise short-term viewer demand, medium-term viewer demand, total number of requests, last-request-time, usage class data, or any combination thereof.
77. (Previously Presented) The process of claim 76, wherein each of the one or more first components is associated with a coefficient indicative of an importance associated with a particular first component.
78. (Previously Presented) The process of claim 77, wherein the coefficient associated with each of the one or more first components can be configured by a user.
79. (Previously Presented) The process of claim 1, wherein the second priority is calculated based on one or more second components associated with a local environment of the target video server.
80. (Previously Presented) The process of claim 79, wherein the one or more second components comprise asset classification, number of replicas available to the target video server, number of replicas stored on the target video server, load on the target video server, available delivery paths to stream the selected asset to users, available bandwidth between the target video server and users, processing speed available to the target video server, or any combination thereof.
81. (Previously Presented) The process of claim 80, wherein each of the one or more second components is associated with a coefficient indicative of a weight associated with a particular second component.

82. (Previously Presented) The process of claim 81, wherein the coefficient associated with each of the one or more second components can be configured by a user.
83. (Previously Presented) The process of claim 1, wherein the retention value comprises a third priority associated with the one or more viewing assets and a fourth priority associated with the target video server.
84. (Previously Presented) A process for propagating digital viewing assets to video servers comprising:
- assigning one or more propagation priorities to each of a plurality of digital viewing assets, each digital viewing asset comprises a set of digital asset elements, each digital asset element of the set comprising a segment of multimedia data, the one or more propagation priorities for a corresponding viewing asset being indicative of an economic value of propagating the viewing asset onto one or more video servers, each propagation priority comprising a first priority associated with the viewing asset and a second priority associated with a corresponding target video server, wherein the first priority is calculated based on short-term viewer demand, medium-term viewer demand, usage class data, or any combination thereof;
 - generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on a target video server and capable of being removed from the target video server as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;
 - selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;
 - comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists;
 - ranking the viewing assets based on the assigned propagation priorities; and
 - propagating, to zero or more of the video servers, those viewing assets according to rank.

85. (Previously Presented) A system for propagating digital viewing assets to video servers comprising:

means for assigning one or more propagation priorities to each of a plurality of digital viewing assets, each digital viewing asset comprises a set of digital asset elements, each digital asset element of the set comprising a segment of multimedia data, the one or more propagation priorities for a corresponding viewing asset being indicative of an economic value of propagating the viewing asset onto one or more video servers, each propagation priority comprising a first priority associated with the viewing asset and a second priority associated with a corresponding target video server, wherein the first priority is calculated based on short-term viewer demand, medium-term viewer demand, usage class data, or any combination thereof;

means for generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on a target video server and capable of being removed from the target video server as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;

means for selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;

means for comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists;

means for ranking the viewing assets based on the assigned propagation priorities;
and

means for propagating, to zero or more of the video servers, those viewing assets according to rank.

86. (Previously Presented) A process for propagating digital viewing assets to target devices comprising:

assigning propagation priorities a plurality of digital viewing assets, each digital viewing asset comprises a set of digital asset elements, each digital asset element of the set comprising a segment of multimedia data, each of the propagation priorities being

predictive of an economic value of propagating a particular asset to a particular target device, each propagation priority comprising a first priority associated with the particular asset and a second priority associated with the particular target device, wherein the first priority is calculated based on short-term viewer demand, medium-term viewer demand, usage class data, or any combination thereof;

generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on a target device and capable of being removed from the target device as a group, each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;

selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;

comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists;

ranking the assets based on the assigned priorities; and

propagating zero or more of the assets to one or more of the target devices according to rank.

87. (Previously Presented) A system for propagating digital viewing assets to target devices comprising:

means for assigning propagation priorities a plurality of digital viewing assets, each digital viewing asset comprises a set of digital asset elements, each digital asset element of the set comprising a segment of multimedia data, each of the propagation priorities being predictive of an economic value of propagating a particular asset to a particular target device, each propagation priority comprising a first priority associated with the particular asset and a second priority associated with the particular target device, wherein the first priority is calculated based on short-term viewer demand, medium-term viewer demand, usage class data, or any combination thereof;

means for generating a set of element deletion lists, each element deletion list identifying a set of asset element replicas that comprise a set of asset replicas presently stored on a target device and capable of being removed from the target device as a group,

each element deletion list being associated with a sum of retention values associated with the corresponding set of asset replicas;

means for selecting one or more element deletion lists having a data size at least as large as a data size of one or more asset elements of the selected viewing asset;

means for comparing the propagation priority of the selected viewing asset against the sum of retention values associated with the one or more selected element deletion lists;

means for ranking the assets based on the assigned priorities; and

means for propagating zero or more of the assets to one or more of the target devices according to rank.